

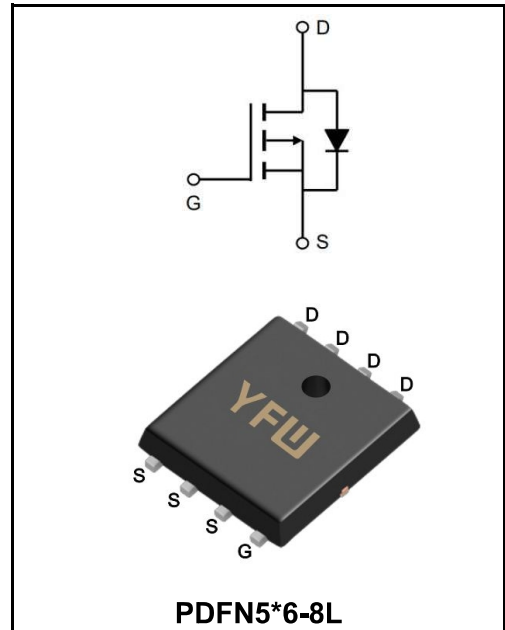
**-40V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	-40A
<b>V<sub>DSS</sub></b>	-40V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=-10V)</sub></b>	< 18mΩ ( <b>Type:15 mΩ</b> )

**Application**

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply



**Maximum Ratings at T<sub>c</sub>=25°C unless otherwise specified**

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	-40	<b>V</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±20	<b>V</b>
Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup> @T <sub>C</sub> =25°C	<b>I<sub>D</sub></b>	-40	<b>A</b>
Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup> @T <sub>C</sub> =100°C	<b>I<sub>D</sub></b>	-23	<b>A</b>
Pulsed Drain Current <sup>2</sup>	<b>I<sub>DM</sub></b>	-120	<b>A</b>
Single Pulse Avalanche Energy <sup>3</sup>	<b>E<sub>AS</sub></b>	125	<b>mJ</b>
Total Power Dissipation <sup>4</sup> @T <sub>C</sub> =25°C	<b>P<sub>D</sub></b>	25	<b>W</b>
Total Power Dissipation <sup>4</sup> @T <sub>A</sub> =25°C	<b>P<sub>D</sub></b>	16	<b>W</b>
Storage Temperature Range	<b>T<sub>STG</sub></b>	-55 to +150	<b>°C</b>
Operating Junction Temperature Range	<b>T<sub>J</sub></b>	-55 to +150	<b>°C</b>
Thermal Resistance Junction-Ambient <sup>1</sup>	<b>R<sub>θJA</sub></b>	25	<b>°C/W</b>
Thermal Resistance Junction-Case <sup>1</sup>	<b>R<sub>θJC</sub></b>	5	<b>°C/W</b>

**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$BV_{DSS}$	-40	-44	-	V
$BV_{DSS}$ Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	-0.023	-	V/°C
Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-30A$	$R_{DS(ON)}$	-	15	18	mΩ
	$V_{GS}=-4.5V, I_D=-20A$		-	18	25	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	4.74	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=-40V, V_{GS}=0V, T_J=25^\circ C$	$I_{DSS}$	-	-	1	μA
	$V_{DS}=-40V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	$I_{GSS}$	-	-	±100	nA
Total Gate Charge(-4.5V)	$V_{DS}=-20V$ $V_{GS}=-4.5V$ $I_D=-12A$	$Q_g$	-	25	-	nC
Gate-Source Charge		$Q_{GS}$	-	11	-	
Gate-Drain Charge		$Q_{gd}$	-	9.5	-	
Turn-on delay time	$V_{DD}=-15V$ $R_L=15\Omega$ $I_D=-1A$ $V_{GEN}=-10V$ $R_G=6\Omega$	$t_{d(on)}$	-	48	-	ns
Rise Time		$T_r$	-	24	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	88	-	
Fall Time		$t_f$	-	9.6	-	
Input Capacitance	$V_{DS}=-20V$ $V_{GS}=0V$ $f=1MHz$	$C_{iss}$	-	2760	-	pF
Output Capacitance		$C_{oss}$	-	260	-	
Reverse Transfer Capacitance		$C_{rss}$	-	85	-	
Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V, \text{Force Current}$	$I_S$	-	-	-40	A
Pulsed Source Current <sup>2,5</sup>		$I_{SM}$	-	-	-90	A
Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	$V_{SD}$	-	-	-1.3	V

Note :

- 1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width  $\cong 300\mu s$  , duty cycle  $\cong 2\%$
- 3、The EAS data shows Max. rating . The test condition is  $V_{DD}=-32V, V_{GS}=-10V, L=0.1mH, I_{AS}=-30A$
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

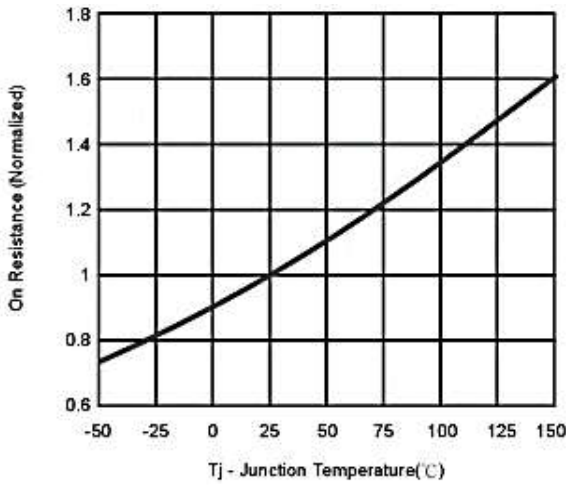


Fig.1 On Resistance Vs Junction Temperature

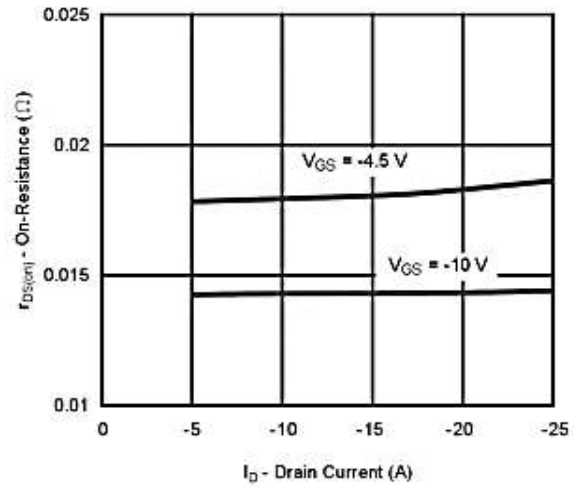


Fig.2 On-Resistance Vs. Drain Current

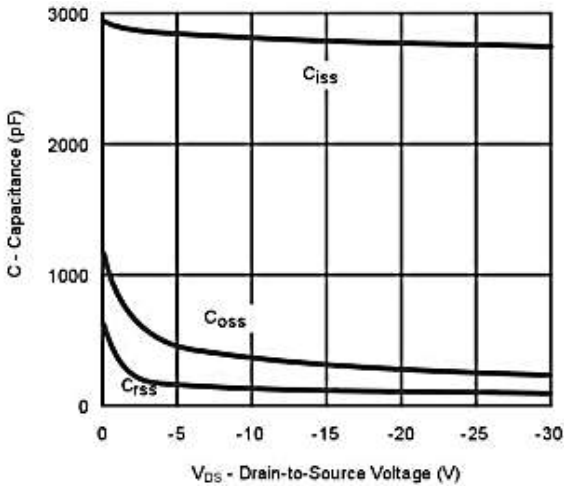


Fig.3 Capacitance

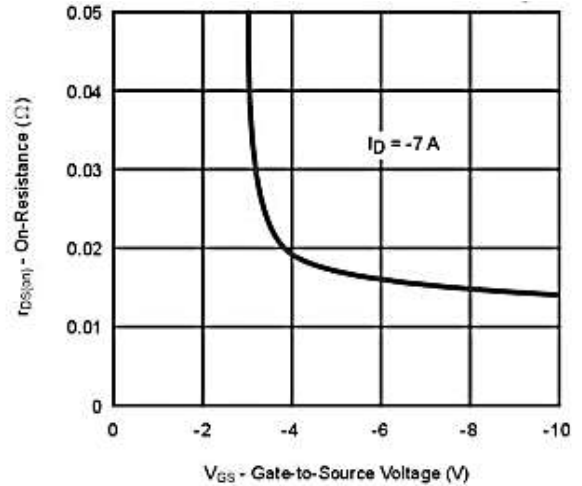


Fig.4 On-Resistance Vs. Gate-to-Source Voltage

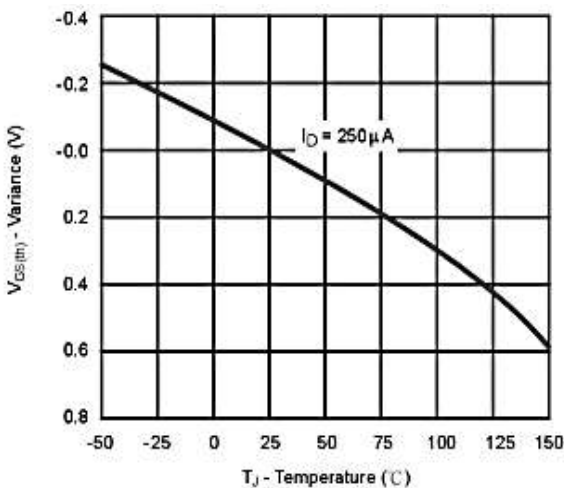


Fig.5 Threshold Voltage

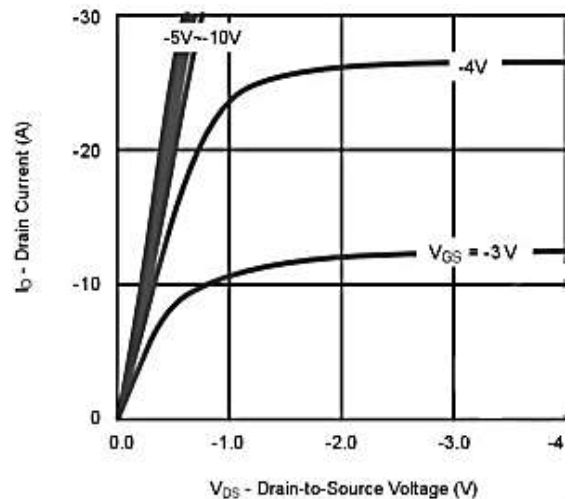


Fig.6 On-Region Characteristics

Ratings and Characteristic Curves

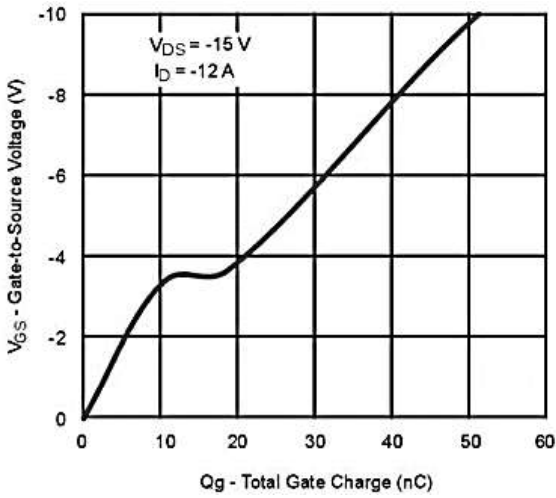


Fig.7 Gate Charge

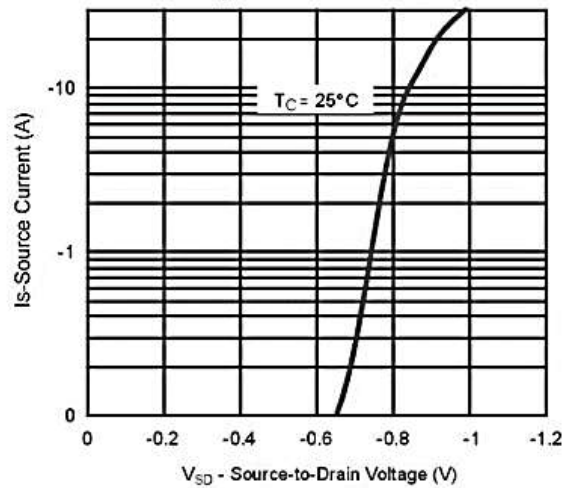


Fig.8 Body-diode Characteristic

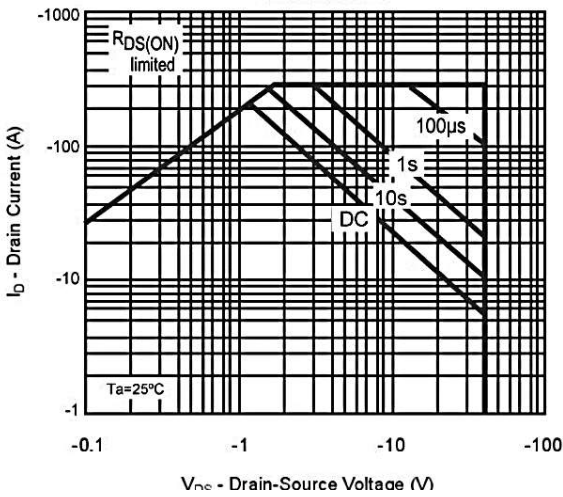


Fig.9 Safe Operating Area

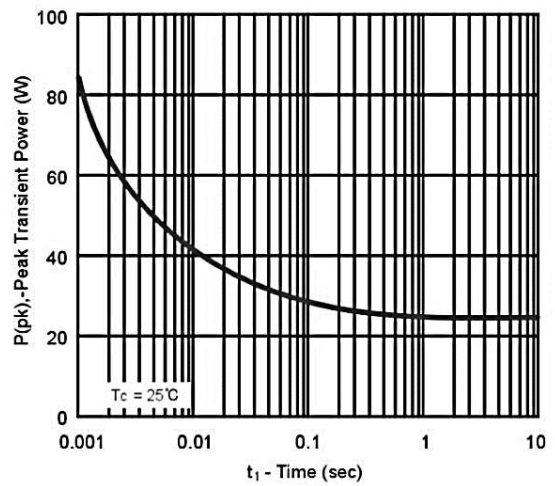


Fig.10 Single Pulse Maximum Power Dissipation

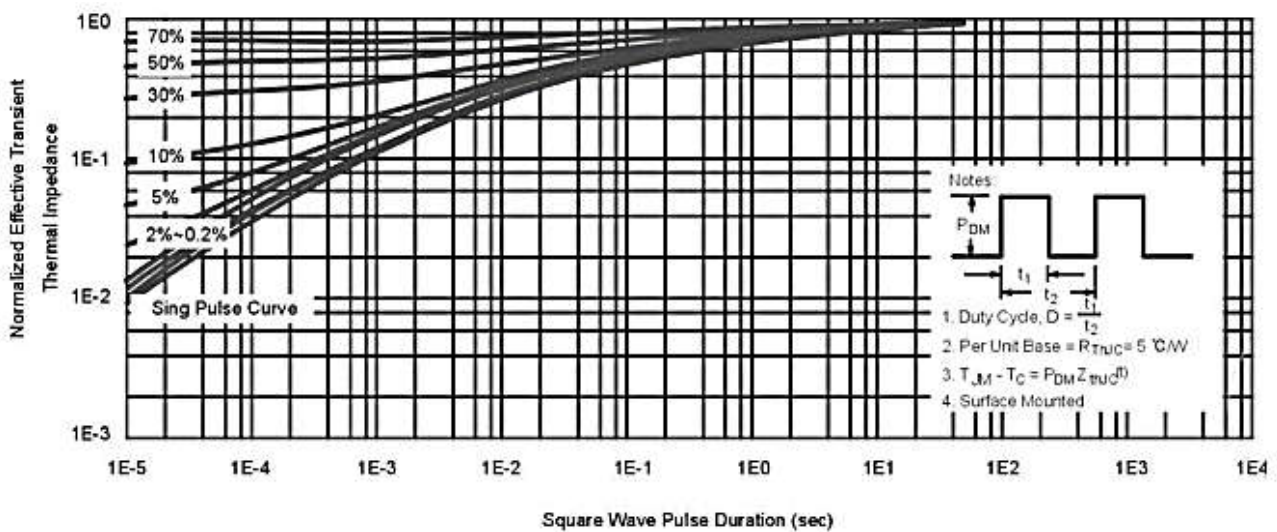
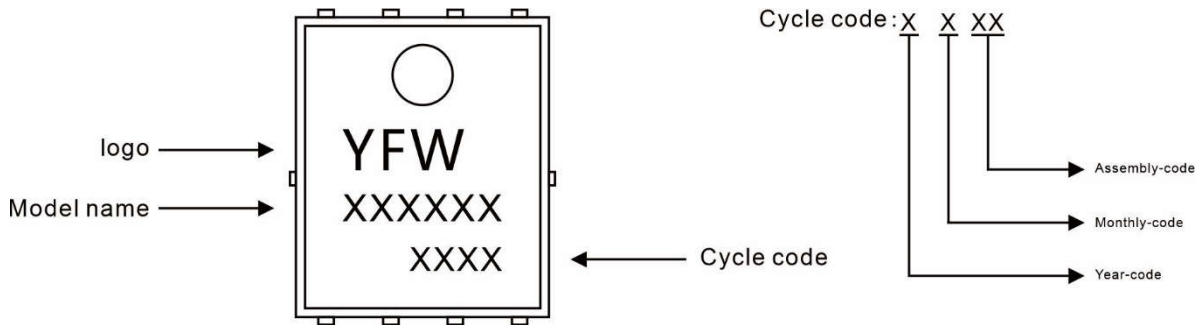


Fig.11 Normalized Maximum Transient Thermal Impedance

**Marking Diagram**



**Ordering information**

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW40P04NF	PDFN5*6-8L	0.0032oz(0.093g)	5000pcs/reel	10000pcs/box 50000pcs/Carton

**Package Dimensions**

PDFN5\*6-8L

Dim	Millimeter		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.2	35	45
A2	0.204	0.304	8	12
b	0.4ref.		16ref.	
b1	0.2	0.4	8	16
D	5.0	5.3	197	209
D1	4.84	5.24	191	206
E	5.95	6.35	234	250
E1	3.275	3.675	129	145
E2	5.69	6.09	224	232
e	1.27typ.		50typ.	
K	1.29typ.		51typ.	
L	0.585	0.785	23	27
L1	0.7typ.		28typ.	

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